CLAIMS

1. A method for producing a titanium-containing perovskite compound, characterized in that the method comprises a step of reacting titanium oxide produced through a vapor-phase method with at least one element selected from a group of alkaline earth metal compound and Pb compound in an alkaline solution.

2. The method for producing a titanium-containing perovskite compound as claimed in claim 1, wherein primary particles of the titanium-containing perovskite compound have a diameter (D1) that is 50 to 200% the size of primary particles of the titanium oxide serving as a starting material, the size (D1) being determined by converting the specific surface area (S) of the particles obtained by the BET method to the total surface area of spheres in accordance with the following equation (1):

$$D1 = 6/\rho S \quad (1)$$

wherein ρ represents a density of the particles and S represents a BET specific surface area.

3. The method for producing a titanium-containing perovskite compound as claimed in claim 1, using ultrafine particles of titanium oxide having a BET specific surface area of 3 to 200 m^2/g.

4. The method for producing a titanium-containing perovskite compound as claimed in claim 1, using the titanium oxide produced by oxidizing titanium tetrachloride at high temperature by use of an oxidizing gas.

5. The method for producing a titanium-containing perovskite compound as claimed in claim 4, using the titanium

oxide produced by a vapor-phase method is produced by respectively introducing a titanium tetrachloride-containing gas and an oxidizing gas which are heated in advance to 500°C or higher into a reaction tube at a flow rate of 10 m/sec or more.

6. The method for producing a titanium-containing perovskite compound as claimed in claim 5, using the titanium oxide produced by retaining the titanium tetrachloride-containing gas and the oxidizing gas in the reaction tube for reaction for one second or shorter under a high-temperature condition higher than 600°C.

7. The method for producing a titanium-containing perovskite compound as claimed in claim 6, using the titanium oxide produced under a condition of an average gas flow rate in the reaction tube of 5 m/sec or more.

8. The method for producing a titanium-containing perovskite compound as claimed in claim 1, using the titanium oxide produced by a vapor-phase method is produced by introducing the preheated titanium tetrachloride-containing gas and oxidizing gas into the reaction tube in such a manner that turbulence is generated in the reaction tube.

9. The method for producing a titanium-containing perovskite compound as claimed in claim 8, using the titanium oxide produced by introducing the titanium tetrachloride-containing gas and the oxidizing gas into the reaction tube through a coaxial parallel flow nozzle and the inner tube of the coaxial parallel flow nozzle has an inside diameter of 50 mm or less.

10. The method for producing a titanium-containing

perovskite compound as claimed in any of claims 4 to 9, wherein the titanium-tetrachloride-containing gas has a titanium tetrachloride content of 10 to 100%.

11. The method for producing a titanium-containing perovskite compound as claimed in claim 5, wherein each of the titanium tetrachloride-containing gas and the oxidizing gas is heated in advance at 800°C or higher.

12. The method for producing a titanium-containing perovskite compound as claimed in claim 1, wherein the titanium oxide produced by a vapor-phase method has a mean particle diameter at a 90% cumulative weight on the particle size distribution curve (D_{90}) of 2.2 μm or less.

13. The method for producing a titanium-containing perovskite compound as claimed in claim 1, wherein the titanium oxide produced through a vapor-phase method has a distribution constant n, as calculated from the following Rosin-Rammler equation (2), of 1.7 or more:

$$R = 100 \exp(-bD^n) \quad (2)$$

wherein D is a particle diameter; R is the percentage of the number of particles larger than D (particle diameter) with respect to the total number of particles; n is a distribution constant; and b is a reciprocal of particle characteristic constant.

14. The method for producing a titanium-containing perovskite compound as claimed in claim 1, wherein the titanium oxide produced by a vapor-phase method contains anatase-crystal-form titanium oxide.

15. The method for producing a titanium-containing perovskite compound as claimed in claim 1, using an alkaline

solution in which a basic compound exists.

16. The method for producing a titanium-containing perovskite compound as claimed in claim 15, wherein the basic compound is selected from ammonium, organic amine and hydroxide of ammonium salt.

17. A titanium-containing perovskite compound, which is produced by a method as claimed in any of claims 1 to 16 above.

18. The titanium-containing perovskite compound exhibiting ferroelectricity as claimed in claim 17.

19. A dielectric material containing a titanium-containing perovskite compound as claimed in claim 18.

20. A paste containing a titanium-containing perovskite compound as claimed in claim 18.

21. A slurry containing a titanium-containing perovskite compound as claimed in claim 18.

22. A thin-film product containing a titanium-containing perovskite compound as claimed in claim 18.

23. A dielectric ceramics containing a titanium-containing perovskite compound as claimed in claim 18.

24. A pyroelectric ceramics containing a titanium-containing perovskite compound as claimed in claim 18.

25. A piezoelectric ceramics containing a titanium-containing perovskite compound as claimed in claim 18.

26. A capacitor containing a dielectric ceramics as claimed in claim 23.

27. An electronic device containing at least one member selected from the group consisting of a thin film product, ceramics and a capacitor as claimed in any one of claims 22 to 26.

28. A sensor containing one or more members of a thin film product or ceramics as claimed in any one of claims 22 to 26.

29. A dielectric film employing a titanium-containing perovskite compound as claimed in claim 18.

30. A capacitor employing a dielectric film as claimed in claim 29.

31. A ferroelectric memory employing a titanium-containing perovskite compound as claimed in claim 18.

32. A capacitor built in a substrate, which capacitor employs a titanium-containing perovskite compound as claimed in claim 18.